PROJECT X: Automated Attendance System

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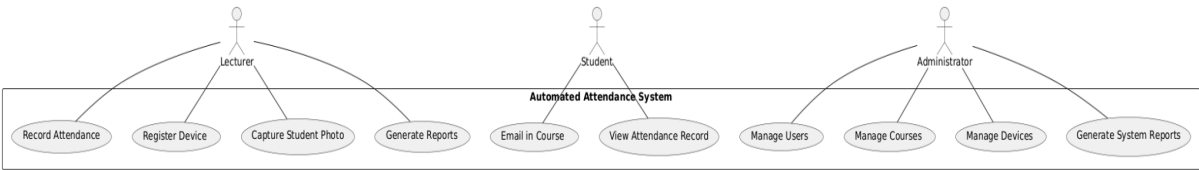Jhomarie Avenido

Cloe Den Mabanding
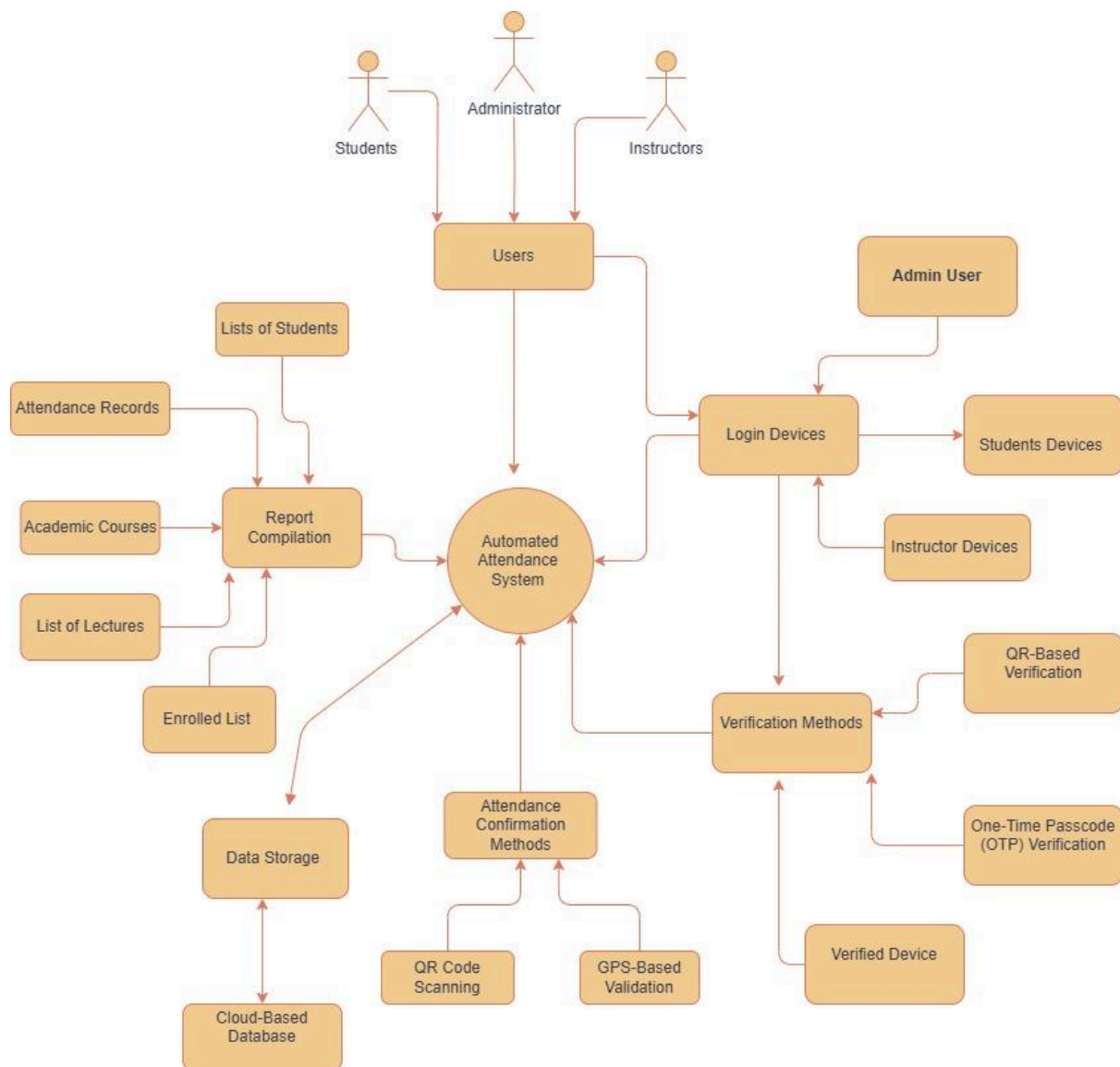
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Use Case Diagram

Automated Attendance System

Lecturer
- Record Attendance
- Register Device
- Capture Student Photo
- Generate Reports

Student
- Email in Course
- View Attendance Record

Administrator
- Manage Users
- Manage Courses
- Manage Devices
- Generate System Reports

Conceptual Diagram

Frontend (Client Side)

- Web & Mobile App (React Native/Flutter) Main interface for users
- Camera Module (Captures student photos)

Backend (Server Side)

- REST API (Node.js/ Express) Manages system interactions
- Authentication Module (Manages login/logout)
- Attendance Processing Module (Records student attendance)

- Report Generation Module (Generates reports)

- Device Tracking Module (Locates registered devices)

Database (Cloud-Based MySQL)

- User & Role Management (Students, Lecturers, Admins)

- Course & Enrollment Data (Tracks student enrollment)

- Attendance Records (Stores attendance data)
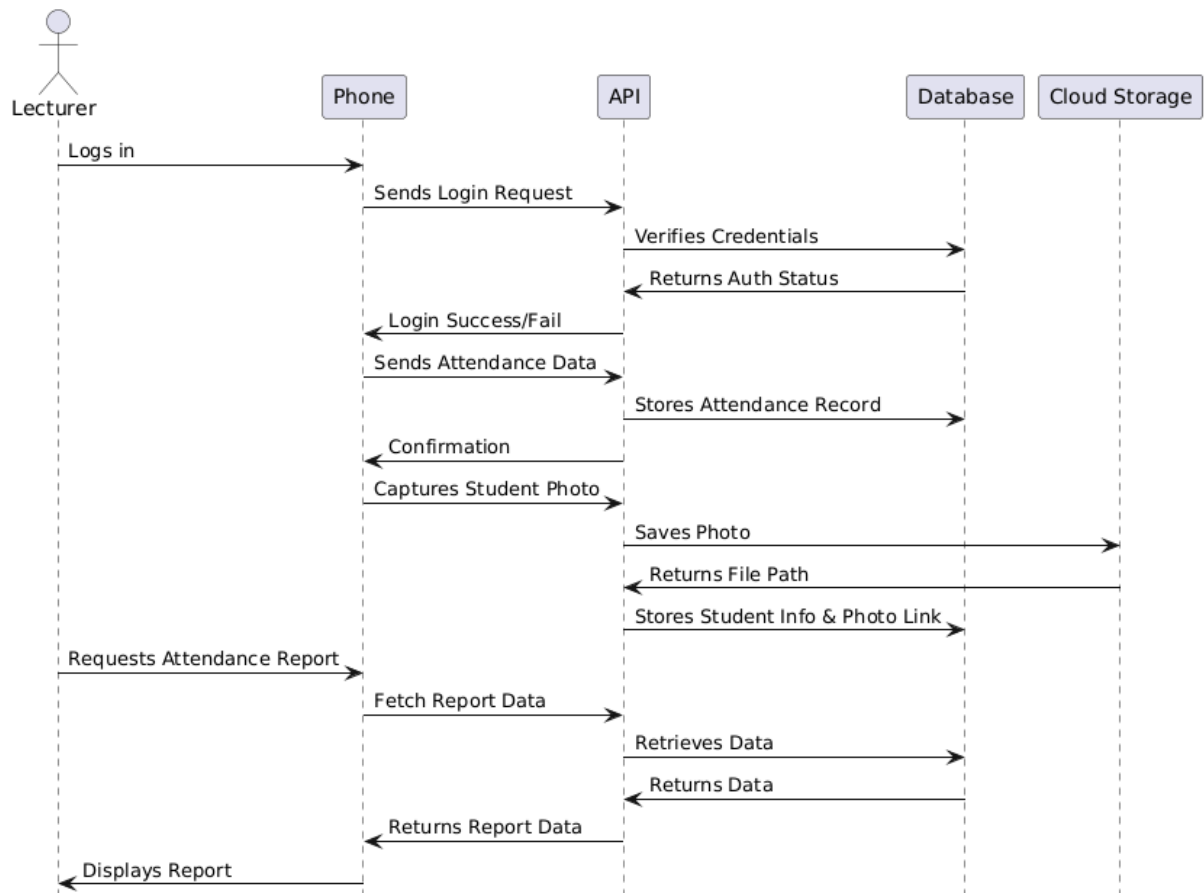
- Photo Storage (Stores student photos)

External Services (Enhancements)

- Cloud Storage (AWS S3, Firebase Storage - Stores images)

- GPS Tracking API (Google Maps API - Locates lecturers)

- Notification Service (Twilio, Firebase Cloud Messaging - Sends reminders)

Component Diagram
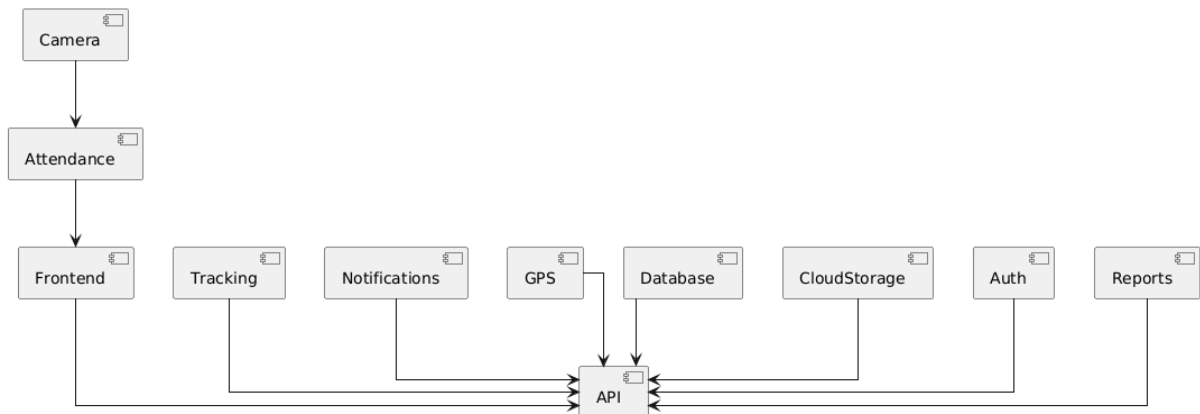
Sequence Diagram

Use Case Scenario: Marking Student Attendance

Actors

· Primary Actor: Lecturer

· Secondary Actors: Student, Administrator

Preconditions

● The lecturer must be logged into the system.

● The class session must be scheduled in the system.

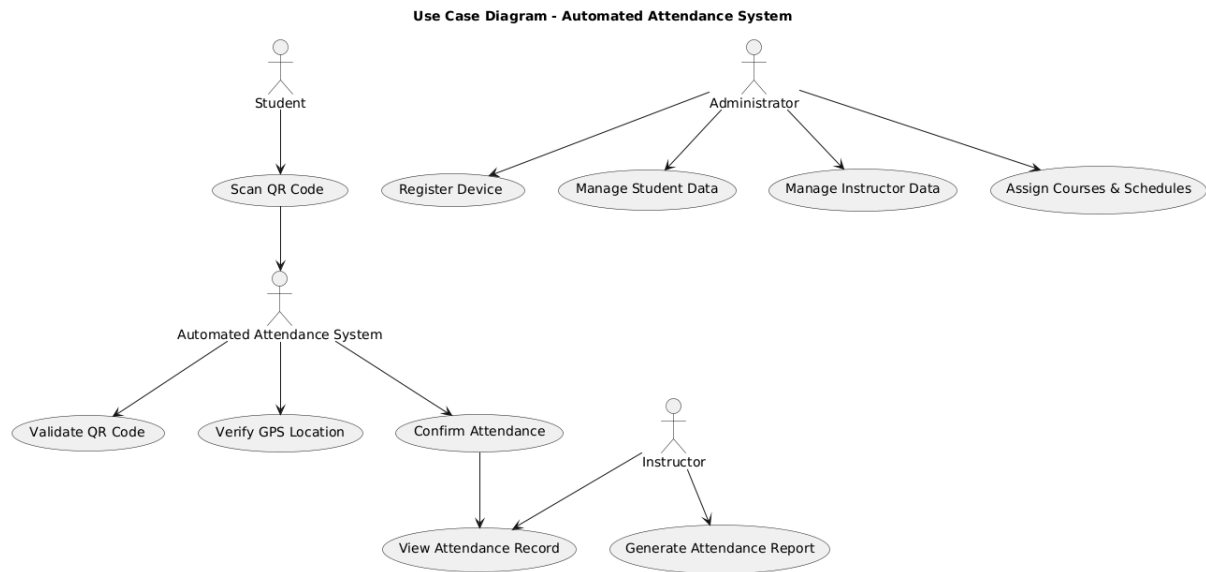● Students must be registered in the system.

Main Flow

1. The lecturer logs into the system.

2. The lecturer selects the course and class session.

3. The system displays the list of enrolled students.

4. The lecturer chooses the attendance marking method (QR code, biometric, manual).

5. Students mark their attendance using the selected method.

6. The system validates the student's presence.

7. Attendance records are updated in real-time.

8. The lecturer submits the attendance record.

9. The system stores the attendance data in the database.

10. The system generates an attendance report.

Alternative Flows

- Invalid Student Attempt: If a student not registered for the course attempts to mark attendance, the system denies access and notifies the lecturer.

- Missed Attendance: If a student fails to mark attendance within the given timeframe, the system marks them absent.

- Offline Mode: If the internet is unavailable, the system stores attendance data locally and syncs it once connected.

Postconditions

- Attendance records are stored in the database.

- Reports are accessible to lecturers and administrators.

- Students can view their attendance status.

Use Case Diagram - Automated Attendance System

Use Case Scenario: Automated Attendance System

Scenario: User Validation via QR Code and OTP Authentication

Actors:

· Student

· Instructor

Preconditions:

· The student must be registered in the system.

· The student must have a valid QR code.

· The instructor must be using a registered device.

Main Flow:

1. The student presents their QR code to the instructor.

2. The instructor scans the QR code using a registered device.

3. The system validates the QR code against the student's record.

4. If the QR code is valid, the system sends a One-Time Password (OTP) to the student's registered mobile number or email.

5. The student enters the OTP in the attendance system.

6. The system verifies the OTP:

o If the OTP is correct, the student's attendance is recorded.

o If incorrect, the system prompts for re-entry (limited attempts).

7. The system updates the attendance records in the database.

8. The student receives a confirmation message.

Alternative Flow (Invalid QR Code or OTP Failure):

· If the QR code is invalid, the system rejects the attendance attempt.

· If the OTP verification fails multiple times, the system locks the student's access temporarily